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## PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY  
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>66395-69852</b>	<b>FOR FURTHER ACTION</b> See Form PCT/IPEA/416	
International application No. <b>PCT/SE 2002/002422</b>	International filing date (day/month/year) <b>20.12.2002</b>	Priority date (day/month/year) <b>27.12.2001</b>
International Patent Classification (IPC) or national classification and IPC <b>H04L 1/18, H04L 29/06, H04Q 7/22</b>		
Applicant <b>Telefonaktiebolaget LM Ericsson (publ) et al</b>		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

3. This report is also accompanied by ANNEXES, comprising:

a.  (*sent to the applicant and to the International Bureau*) a total of 4 sheets, as follows:

sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).

sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

b.  (*sent to the International Bureau only*) a total of (indicate type and number of electronic carrier(s))  
, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

<input checked="" type="checkbox"/>	Box No. I	Basis of the report
<input type="checkbox"/>	Box No. II	Priority
<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/>	Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input checked="" type="checkbox"/>	Box No. VI	Certain documents cited
<input type="checkbox"/>	Box No. VII	Certain defects in the international application
<input type="checkbox"/>	Box No. VIII	Certain observations on the international application

Date of submission of the demand <b>07.07.2003</b>	Date of completion of this report <b>30.03.2004</b>
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. +46 8 667 72 88	Authorized officer <b>Anders Edlund /OGU</b> Telephone No. +46 8 782 25 00

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/SE 2002/002422

## Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

This report is based on a translation from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of:

- international search (under Rules 12.3 and 23.1(b))  
 publication of the international application (under Rule 12.4)  
 international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

the international application as originally filed/furnished

the description:

pages 1 - 18 as originally filed/furnished

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

the claims:

pages \_\_\_\_\_ as originally filed/furnished

pages\* \_\_\_\_\_ as amended (together with any statement) under Article 19

pages\* 1 - 4 received by this Authority on 16.01.2004

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

the drawings:

pages 1 - 8 as originally filed/furnished

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3.  The amendments have resulted in the cancellation of:

- the description, pages \_\_\_\_\_  
 the claims, Nos. \_\_\_\_\_  
 the drawings, sheets/figs \_\_\_\_\_  
 the sequence listing (*specify*): \_\_\_\_\_  
 any table(s) related to the sequence listing (*specify*): \_\_\_\_\_

4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- the description, pages \_\_\_\_\_  
 the claims, Nos. \_\_\_\_\_  
 the drawings, sheets/figs \_\_\_\_\_  
 the sequence listing (*specify*): \_\_\_\_\_  
 any table(s) related to the sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International Application No.

PCT/SE 2002/002422

**Box No. V** Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims	<u>1-13, 15-16, 18-21</u>	YES
	Claims	<u>14, 17</u>	NO
Inventive step (IS)	Claims		YES
	Claims	<u>1-21</u>	NO
Industrial applicability (IA)	Claims	<u>1-21</u>	YES
	Claims		NO

## 2. Citations and explanations (Rule 70.7)

Reference is made to the following documents:

- D1: US 6097731 A1
- D2: WO 0024152 A1
- D3: EP 1107626 A2
- D4: WO 0137493 A1

In D1, a data retransmission method for a confirmation information transmission is provided which improves reliability of information transmission by preventing the loss of data when a transmission of data from layer 3 fails in layer 2, (see abstract).

D1-D4 are state of the art documents, and will therefore not be mentioned anymore.

Claims 14 and 18:

The object of the invention is to solve the problem which occurs when two layers in a protocol stack is responsible for error detection and retransmission.

In D1, which is considered to be the most relevant document, a data retransmission method for a confirmation information transmission is provided which improves reliability of information transmission by preventing the loss of data when a transmission of data from layer 3 fails in layer 2. When transmitting layer-3-data from layer 3 to layer 2, layer 2 initiates timer observation and simultaneously transmits confirmation data to layer 1. If this transmission fails, a reply from layer 1 cannot be received and a retransmission procedure also fails, layer 2 notifies layer 3 of transmission failure, and simultaneously discards the layer-3-data. Layer 3 retransmits to layer 2 the layer-3-data which it previously

.../...

**Supplemental Box**

In case the space in any of the preceding boxes is not sufficient.

Continuation of Box V.

transmitted, and layer 2 again transmits confirmation data to layer 1. If this transmission succeeds, layer 2 terminates the timer observation and notifies layer 3 of the successful transmission, (see the entire document).

Since all technical features of these claims are considered to be disclosed in D1 the requirements with respect to novelty are not met for the subject-matter claimed in claims 14 and 17. The technical features described in these claims are the same as those described in D1. Therefore, the invention claimed in claims 14 and 17 is not considered novel.

**Claim 1:**

The invention according to claim 1 differs from D1 since it is mentioned in these claims that the protocol data unit is identified with help of an identifier.

The aim of this identifier is to identify a protocol data unit between the protocol layers.

For a person skilled in the art, it is considered obvious, that D1 has some kind of layer 3 identification, which identifies the data unit and that the protocol layers 2 and 3 uses this identification in order to identify a data unit between them. Therefore the invention according to claim 1 is not considered to involve an inventive step.

**Claims 2-13, 15-16 and 18-21:**

In these claims, are other obvious technical features stated for transmission of data between protocols. These claims differ from the invention claimed in claims 1, 14 and 17 in obvious details concerning retransmission of data between protocols. The inclusions of such features are regarded as part of customary praxis a skilled person would consider in accordance with circumstances. From that described in these claims, it is considered obvious for a person skilled in the art, with the knowledge of D1, to accomplish a method for retransmission of data as described in these claims. Therefore, the invention claimed in claims 2-13, 15-16 and 18-21 is not considered to involve an inventive step.

**Conclusion:**

The invention according to claims 1-13, 15-16, 18-21 is considered to be novel and claims 1-21 is considered to be industrially applicable, but claims 1-21 is not considered to involve an inventive step.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International Application No.  
PCT/SE 2002/002422

## Box No. VI Certain documents cited

## 1. Certain published documents (Rule 70.10)

Application No. Patent No.	Publication date (day/month/year)	Filing date (day/month/year)	Priority date (valid claim) (day/month/year)
WO 02069547 A1	06/09/2003	08/02/2002	28/02/2001

## 2. Non-written disclosures (Rule 70.9)

Kind of non-written disclosure	Date of non-written disclosure (day/month/year)	Date of written disclosure referring to non-written disclosure (day/month/year)

**Claims**

1. A method in a data communication system wherein data is transmitted by use of at least two protocols that are capable of re-transmission of data, each of said protocols being implemented in at least two nodes of said data communication system, the implementation 5 of a protocol implemented in a transmitting node being a transmitting protocol entity and the implementation of a protocol in a receiving node being a receiving protocol entity, one of said at least two protocols capable of re-transmission of data being a higher layer protocol than another of said at least two protocols, said another protocol therefore being a lower layer protocol, the higher layer transmitting protocol entity providing the lower layer transmitting protocol entity with a protocol data unit to be transmitted, said method being 10 characterised by the following steps:

awaiting, in the higher layer transmitting protocol entity, a transmission result from said lower layer transmitting protocol entity, said transmission result reporting the result of the transmission of said protocol data unit by said lower layer transmitting protocol entity;

15 receiving, in said higher layer transmitting protocol entity, said transmission result;

deciding, responsive to said transmission result, whether the higher layer transmission protocol entity should re-provide said lower layer transmitting protocol entity with said protocol data unit; and

20 identifying, by the higher layer transmitting protocol entity in communication with the lower layer transmitting protocol entity, said protocol data unit by use of an identifier.

2. The method of claim 1, wherein

encapsulation of data is carried out by means of protocols located in different nodes.

25

3. The method of claim 1, wherein

said identifier is an identifier local to the communication between the higher layer transmitting protocol entity and the lower layer transmitting protocol entity.

30

4. The method of claim 3, wherein

said identifier is assigned to said protocol data unit by said higher transmitting protocol entity.

5. The method of any of claims 1-4, wherein

said higher layer transmitting protocol entity receives an acknowledgement of reception of said protocol data unit from said lower layer transmitting protocol entity after having provided said lower layer transmitting protocol entity by said protocol data unit, said protocol data unit being identified by said identifier in said acknowledgement of reception.

6. A method according to claim 1, modified in that said steps of awaiting, receiving and

10 deciding are replaced by the following step:

sending, from the lower layer transmitting protocol entity, a transmission result to the higher layer transmitting protocol entity, said transmission result reporting the result of transmission of said protocol data unit by said lower layer transmitting protocol entity.

15 7. The method of claim 6, wherein

said transmission result is transmitted to said higher layer transmitting protocol entity in a message which is transparently relayed by some or all of any intermediate protocol entities.

20 8. The method of claim 6 or 7, wherein

said protocol data unit is identified, by the lower transmitting protocol entity in communication with the higher layer transmitting protocol entity, by use of an identifier.

25 9. The method of claim 8, wherein

said identifier is assigned to the protocol data unit by said lower layer transmitting protocol entity.

10. The method of any of claims 1-9, wherein

said higher layer transmitting protocol entity and said lower layer transmitting protocol entities are located within different nodes.

30 11. The method of any of claims 1-10, wherein

said data communication system comprises a radio interface.

12. The method of claim 11, wherein

said radio interface is a radio interface in a mobile radio communication system.

5 13. The method of claim 12, wherein

said mobile radio communication system is a mobile radio communication system  
operating according to the General Packet Radio System standard; and

the higher layer transmitting protocol entity is a Logical Link Control protocol and  
the lower layer transmitting protocol entity is a Radio Link Control/Media Access Control  
10 protocol.

14. A computer program comprising software code portions for, when said software code  
portion is run on a computer serving as a transmitting node in a data communications  
system, providing another computer program with a protocol data unit to be transmitted  
15 within said data communication system, said computer program further comprising  
software code portions for re-providing said another computer program with said protocol  
data unit, said computer program being **characterised by**

computer code portions for awaiting, from said another computer program, a  
transmission result reporting the transmission of said protocol data unit;

20 computer program portions for receiving said transmission result from said another  
computer program; and

computer code portions for deciding whether or not to re-provide said protocol data  
unit to said another computer program, said computer code portions for deciding being  
adapted to use said transmission result in deciding whether or not to re-provide said  
25 protocol data unit.

15. The computer program of claim 14, further comprising

computer code portions for allocating an identifier to each protocol data unit, and  
computer code portions for informing said another computer program about said

30 identifier.

16. The computer program of any of claims 14-15, said computer code portions for providing and re-providing being adapted to provide and re-provide according to the Logical Link Control protocol.

5       17. A computer program comprising software code portions for, when said software code portion is run on a computer serving as a transmitting node in a data communications system, receiving from another computer program a protocol data unit to be transmitted within said data communication system and computer code portions for transmitting said protocol data unit, said computer program further comprising software code portions for re-transmitting said protocol data unit, said computer program being characterised by software code portions for sending a message including the result of the transmission or re-transmission of said protocol data unit to said another computer program, further comprising  
10              software code portions for allocating an identifier to said protocol data unit, and  
            software code portions for informing said another computer program about said  
            identifier.  
15

18. The computer program of claim 17, said computer code portions for receiving, transmitting and re-transmitting being adapted to receive, transmit and re-transmit according to the Radio Link Control/Media Access Control protocol.

20       19. A computer program product comprising a computer readable medium, having stored thereon a computer program according to any of claims 14-18.

25       20. A node in a data communication system wherein data is communicated, said node being characterised by  
            a computer program product according to claim 19.

30       21. A data communication system wherein data is communicated being characterised by  
            a node according to claim 20.